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тройники 15 и закрепляются на ремонтируемой трубе. Ходовой винт 13 начинает вращаться, а гайка 12, перемещаясь вверх по винту, толкает перед собой через распорную втулку 14 расширяющий конус 4 и цапговую головку 5. При этом конус с головкой входит в гофрированный патрубок, предварительно расширив его, а хвостовик 7 обоймы 6 перемещается относительно втулки 9 до упора один в другой буртов 8 и 11. После этого обойма 6 останавливается, а цапговая головка, продолжая двигаться, освобождается от обоймы, упруго расширяется, расширяет гофрированный патрубок и прижимает его к ремонтируемой трубе. При дальнейшем движении расширяющегося конуса и цапговой головки обеспечивается равномерное прижатие пластины к трубе по всей его длине. Осевая нагрузка на устройство определяется при этом в основном только действием гофрированного патрубка и поэтому остается примерно постоянной.

Устройство работает без перегрузок, имеет высокую надежность и может применяться для установки длинных метал-

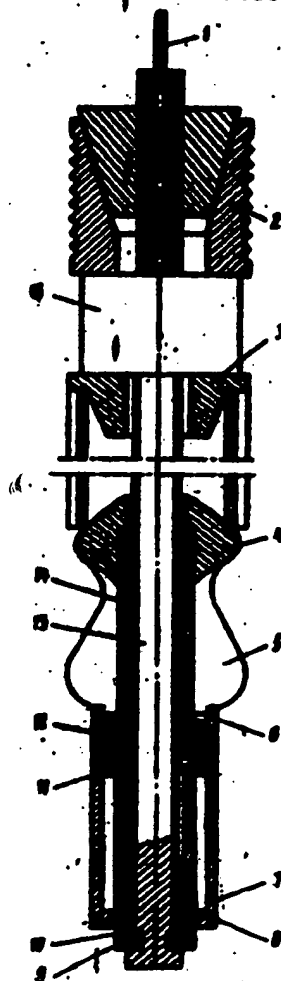
лических пластин в трубах малого диаметра и с ослабленным стенками.

Формула изобретения

Устройство для установки металлического пластины внутри трубы, содержащее ходовой винт с гайкой, электродвигатель, шпору, распорную втулку, на которой установлен расширяющий конус, цапговая головка и обойма, отличающееся тем, что, с целью снижения осевой нагрузки при его работе, оно снабжено пластинкой соединенной с обоймой хвостовиком с буртом и концентрично размещенной в хвостовике и связанной с ходовым винтом втулкой с ответным буртом.

Источники информации, принятые во внимание при экспертизе:

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2. Патент США № 3179168, кл. 166-14 1965.



ИЗДАНИЕ Заказ 4613/24
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State Committee of the USSR Council of Ministers on Inventions and Discoveries	(61) Inventor's certificate of addition — (22) Applied Jan 04 1976 (21) 2308455/22-03 with the attachment of application No. - (23) Priority -	(51) Int. Cl. ² E 21 B 29/00
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(72) Inventors	V. V. Eremenko, S. V. Vinogradov, F. F. Konrad, S. F. Petrov, V. N. Savchenko, and V. A. Gabets	
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(54) DEVICE FOR PLACING A METAL PATCH INSIDE A PIPE

1

The invention relates to devices used in the oil and gas industry for casing repair in drilled and development wells.

A device is known for placing a metal patch inside a pipe that contains a support flange on a housing, a sub or an anchor, a rigid and a multisector expanding cone, a drive for the cones implemented in the form of a hydrocyclone, a screw pair, or a linkage [1].

A disadvantage of the aforementioned device involves the fact that significant axial loads arise during its operation.

The closest known design is a device for placing a metal patch inside a pipe that contains a feed screw with nut, an electric drive, an anchor, a patch blank, a spacer bushing with an expanding cone, a collet head, and a holder mounted thereon [2].

A disadvantage of this design is the fact that the collet head is released from the locking holder before it enters the corrugated sleeve. Upon subsequent entry of the already expanded collet head into the corrugated sleeve,

the resistance to its motion and the axial loads on the device as a whole increase many-fold.

The aim of the invention is to reduce the axial loads on the device during its operation.

This is achieved by the fact that the device is equipped with a liner that is rigidly connected with the holder and that has a shoulder, and a bushing concentrically disposed in the liner and connected with a feed screw and with a mating shoulder.

The drawing depicts the device for placing a metal patch inside a pipe, in longitudinal section.

The device has electric cable 1, anchor slips 2, support 3 for the patch blank, expanding cone 4, collet head 5, holder 6, liner 7 of the holder with thrust shoulder 8, bushing 9 with shoulders 10 and 11, nut 12, feed screw 13, spacer bushing 14, and electric drive 15.

The device operates as follows. The patch blank in the form of a longitudinally corrugated sleeve is secured between support 3 and cone 4. In that position, the device is lowered on the cable into the well, to the interval where the patch is to be set. Then electric drive 15 is turned on

and it is secured in the pipe to be repaired. Feed screw 13 begins to rotate, while nut 12 moving upward along the screw, pushes ahead of it expanding cone 4 and collet head 5 through spacer bushing 14. Then the cone with the head enters the corrugated sleeve, pre-expanding it, while liner 7 of holder 6 moves relative to bushing 9 as far as shoulder 8 will go to the other shoulder 11. After this, holder 6 stops, while the collet head, continuing to move, is released from the holder, is elastically expanded, straightens out the corrugations of the patch, and squeezes it against the pipe to be repaired. Further motion of the expanding cone and collet head ensures that the patch is uniformly squeezed against the pipe over its entire length. The axial load on the device in this case is determined mainly only by the rigidity of the corrugated sleeve and so remains approximately constant.

The device operates without overloading, has high reliability, and can be used to place long metal

patches in small-diameter pipes even with weakened walls.

Claim

A device for placing a metal patch inside a pipe, containing a feed screw with nut, an electric drive, an anchor, a patch blank, a spacer bushing with an expanding cone, collet head, and holder mounted thereon, *distinguished* by the fact that, with the aim of reducing axial loads during its operation, it is equipped with a liner that is rigidly connected with the holder and that has a shoulder, and a bushing concentrically disposed in the liner and connected with a feed screw and with a mating shoulder.

Information sources considered in the examination

1. I. A. Sidorov, Repairing Leaks in Oil and Gas Wells. Drilling Series. [in Russian], VNIIOENG, Moscow (1972), pp. 56-61.
2. US Patent No. 3179168, cl. 166-14, 1965.

[see Russian original for figure]

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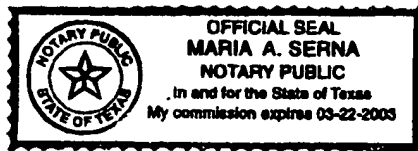
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